CLAIMS

1. A clock pulse apparatus providing a clock pulse signal at a predetermined clock operating frequency, the apparatus comprising a frequency source producing a source signal oscillating at a source frequency substantially the same as the predetermined clock operating frequency, the frequency source being coupled with a negative resistance oscillator, the oscillator amplifying and feeding back at least a portion of the source signal to the frequency source to sustain the source signal oscillating thereby.

2. The clock pulse apparatus of Claim 1, further comprising:

a frequency source having a crystal unit providing a source signal at a predetermined overtone frequency; and

an overtone filter coupled with the negative resistance oscillator, the filter attenuating signals beyond a preselected passband generally centered around the predetermined overtone frequency.

3. The clock pulse apparatus of Claim 2, further comprising a drive level control coupled with the negative resistance oscillator, the drive level control receiving a filtered base signal from the negative resistance oscillator and providing a level-regulated clock pulse signal at the predetermined clock operating frequency thereby.

4. The clock pulse apparatus of Claim 2, wherein the frequency source comprises a crystal unit operated in series mode with the operating frequency of the crystal unit being an

overtone frequency thereof, and wherein the operating frequency of the crystal is substantially the same as the predetermined clock operating frequency.

5. The clock pulse apparatus of Claim 1, further comprising:

a frequency source having a micromechanical resonator providing a source signal at a predetermined overtone frequency;

an overtone filter coupled with the negative resistance oscillator, the filter attenuating signals from the negative resistance oscillator beyond a preselected passband generally centered around the predetermined overtone frequency; and

a drive level control coupled with the negative resistance oscillator, the drive level control receiving a filtered base signal from the negative resistance oscillator and providing a level-regulated clock pulse signal at the predetermined clock operating frequency thereby.

6. The clock pulse apparatus of Claim 2, wherein the overtone filter is bandpass filter with the center of a passband generally the same as a preselected passband centered around the predetermined overtone frequency.

7. The clock pulse apparatus of Claim 6, wherein the overtone filter comprises a plurality of bandpass filters with the center of a passband for selected ones of the bandpass filters generally the same as a preselected passband centered around the predetermined overtone frequency.

8. The clock pulse apparatus of Claim 6, wherein the overtone filter comprises a low-pass filter cascaded with a high-pass filter in which passbands of the highpass filter and low-pass filter are disposed to overlap such that a resulting passband is generally the same as a preselected passband centered around the predetermined overtone frequency.

9. The clock pulse apparatus of Claim 5, further comprising a frequency multiplier generating a predetermined clock operating frequency which is a multiple of the predetermined overtone frequency.

10. The clock pulse apparatus of Claim 3, wherein the negative resistance oscillator comprises two current bias loops coupled by a transistor having a gate, and the drive level control provides a control signal to the gate such that a variable conductance between the two loops is provided thereby.

11. The clock pulse apparatus of Claim 7, wherein output of at least two of the plurality of bandpass filters are cross-coupled.

12. A clock pulse apparatus providing a clock pulse signal at a predetermined clock operating frequency, the apparatus comprising:

a frequency source producing a source signal oscillating at a source frequency substantially the same as the predetermined clock operating frequency, the frequency source having a crystal unit operated in series mode providing the source signal at a predetermined overtone frequency and wherein the operating

frequency of the crystal is substantially the same as the predetermined clock operating frequency;

a negative resistance oscillator coupled with the frequency source, the negative resistance oscillator amplifying and feeding back at least a portion of the source signal to the frequency source, sustaining the source signal oscillating thereby;

an overtone filter coupled with the negative resistance oscillator, the filter attenuating signals beyond a preselected passband generally centered around the predetermined overtone frequency; and

a drive level control coupled with the negative resistance oscillator, the drive level control receiving a filtered base signal from the negative resistance oscillator and providing a level-regulated clock pulse signal at the predetermined clock operating frequency thereby.

13. The clock pulse apparatus of Claim 12, wherein the overtone filter is bandpass filter with the center of a passband generally the same as a preselected passband centered around the predetermined overtone frequency.

14. The clock pulse apparatus of Claim 13, wherein the overtone filter comprises a plurality of bandpass filters with the center of a passband for selected ones of the bandpass filters generally the same as a preselected passband centered around the predetermined overtone frequency.

15. The clock pulse apparatus of Claim 13, wherein the overtone filter comprises a low-pass filter cascaded with a high-pass filter in which passbands of the highpass filter and

low-pass filter are disposed to overlap such that a resulting passband is generally the same as a preselected passband centered around the predetermined overtone frequency.

16. The clock pulse apparatus of Claim 12, further comprising a frequency multiplier generating a predetermined clock operating frequency which is a multiple of the predetermined overtone frequency.

17. A method for producing a clock pulse, comprising:

producing a source signal from a frequency source at a preselected source frequency;

amplifying the source signal to a base signal at a predetermined base signal frequency;

feeding at least a portion of the base signal back to the frequency source sustaining oscillations thereby;

filtering the base signal to provide a filtered base signal generally centered on the preselected source frequency; and

level controlling the base signal to produce a clock signal at a clock operating frequency, wherein the clock operating frequency is substantially the same as the preselected source frequency.

18. The method of Claim 17, wherein producing a source signal from a frequency source further comprises providing a crystal unit frequency source and producing a source signal at a preselected overtone frequency of crystal unit frequency source.

19. The method of Claim 18, wherein the filtering further comprises bandpass filtering having a passband generally centered on the preselected overtone frequency.

20. The method of Claim 18, wherein the filtering further comprises cascading lowpass filtering and highpass filtering with a lowpass passband overlapping a highpass passband such that the resulting passband is generally centered on the preselected overtone frequency.